

Lab 11

Human Reflex Physiology:	Exercise 22
General Sensation:	Exercise 23
Special Senses: Vision	Exercise 24
Special Senses: Hearing and Equilibrium	Exercise 25

Human Reflex Physiology - Exercise 22

Activity 9: Testing Reaction Time for Basic and Acquired Reflexes. 1 (follow directions from Activity 1), 2.

General Sensation - Exercise 23

Activity 2: Demonstrating the Two-Point Threshold - see Review and Activity Sheet for sites to test.

Activity 3: Tactile Localization- see Review and Activity Sheet for sites to test.

Vision - Some of the activities below can be done at home.

Activity 1: Identifying Accessory Eye Structures

Activity 2: Identifying Internal Structures of the Eye

Dissection: The Cow Eye

Activity 5: Demonstrating the Blind Spot - Page 86

Activity 6: Determining Near Point Accommodation - Page 87

Activity 7: Testing Visual Acuity - Page 88

There is a white line on the lab floor 20 feet from the chart.

Activity 8: Testing for Astigmatism - Page 89

Activity 9: Testing for Color Blindness - Page 89

Activity 10: Testing for Binocular Vision - Page 89

Demonstrating Afterimages - Page 87

Negative afterimage

(www.biology-online.org/dictionary/Negative_afterimage)

An afterimage in which the lightness relationship is reversed; if chromatic, it appears in complementary color. for example a green image that is looked at for a while when gaze is turned to a white sheet of paper it would have a red afterimage. Afterimages usually last from about a few seconds to a minute. most nerve cells quickly readjust.

➔ Use the picture of the American flag at the front of the lab. Stare at the image for one minute and then look at the white area below the flag until an image appears. It can take several seconds.

Hearing

Activity 1: Identifying Structures of the Ear.

Name _____

Lab Section _____

Reflexes and Sensation - Data and Review Sheets

Exercise 22

1. Exercise 22 Activity 9: Testing Reaction Time for Basic and Acquired Reflexes.

Record observations of the patellar reflex. (Was it slow or fast? What happened?)

Which muscle contracted? _____

Which nerve carries the afferent and efferent impulses? _____

Record your data for the learned reflex.

Trial	Centimeters	Seconds
1		
2		
3		
4		
5		

What is meant by a learned or acquired reflex?

Which of these two reflexes is learned or acquired?

Usually the response time in trial 1 is longer than that of the patellar reflex. Was that your observation? _____

Explain why it is usually the case.

Did the response time for the learned reflex change with practice?

Exercise 23

1. Exercise 23 Activity 2 and Activity 3

Record the results of Exercise 23 Activity 2: Determining the Two-point Threshold (p. 260) and Activity 3: Testing Tactile Localization (p. 261) here.

Body Area Tested	Two-point threshold (mm.)	Tactile Location
Face		XXXXXXXXXXXX
Back of hand		
Palm of hand		
Fingertips		
Lips		XXXXXXXXXXXX
Back of neck		XXXXXXXXXXXX
Ventral forearm		

Based on the results of the two point discrimination test, are touch receptors evenly distributed over the body surface?

Explain your answer.

What correlation, if any, do you observe between the ability to determine which part of the skin has been touched (tactile localization) and the primary somatosensory map of the postcentral gyrus in your text?

Explain why a correlation might be expected.

Give three examples of sensory receptors in the skin that have punctate distribution.

a. _____

b. _____

c. _____

Special Senses

Data Sheet

1. Record the results of the **Snellen Test for Visual Acuity**

Right eye unaided _____ Right eye with correction _____

Left eye unaided _____ Left eye with correction _____

Why is it important to check each eye separately?

2. Record the results of the test for **Near Point of Accommodation**

Right eye _____ Left eye _____

Is your near point within normal range?

3. Record your results for the **Astigmatism Test**.

4. a. Describe what happened when you stared at the flag figure and then looked at a white background.

b. What is this called?

Cow Eye Dissection

Questions

1. What is the name of the place where is the retina attached to the eyeball?
2. What is the relationship between the location of the optic disc and the optic nerve?
3. Compare the shape of the cow pupil to the pupil of the human eye.
4. What is the role of the tapetum lucidum?
5. Does the human eye have a tapetum lucidum?
6. How are the cornea and lens affected by the preservative?
7. What is the path of light from outside the eyeball to the retina?

outside eyeball

retina _____

Review Sheet

1. What does 20/20 vision mean?
2. What does 20/40 vision mean?
3. What does 20/15 vision mean?
4.
 - a. What is astigmatism?
 - b. What is the test for astigmatism?
5.
 - a. Why is vision lost when light passes over the blind spot?
 - b. What receptors are responsible for color vision and where are most of them located?
 - c. What receptors are responsible for vision in shades of gray?

6. a. Where are the extrinsic or external eye muscles attached to the eyeball?

b. Which branch of the nervous system controls these muscles?

Somatic motor

Autonomic (circle one)

c. Where are the internal muscles of the eye located? (2 places)

d. Which branch of the nervous system controls these muscles?

Somatic motor

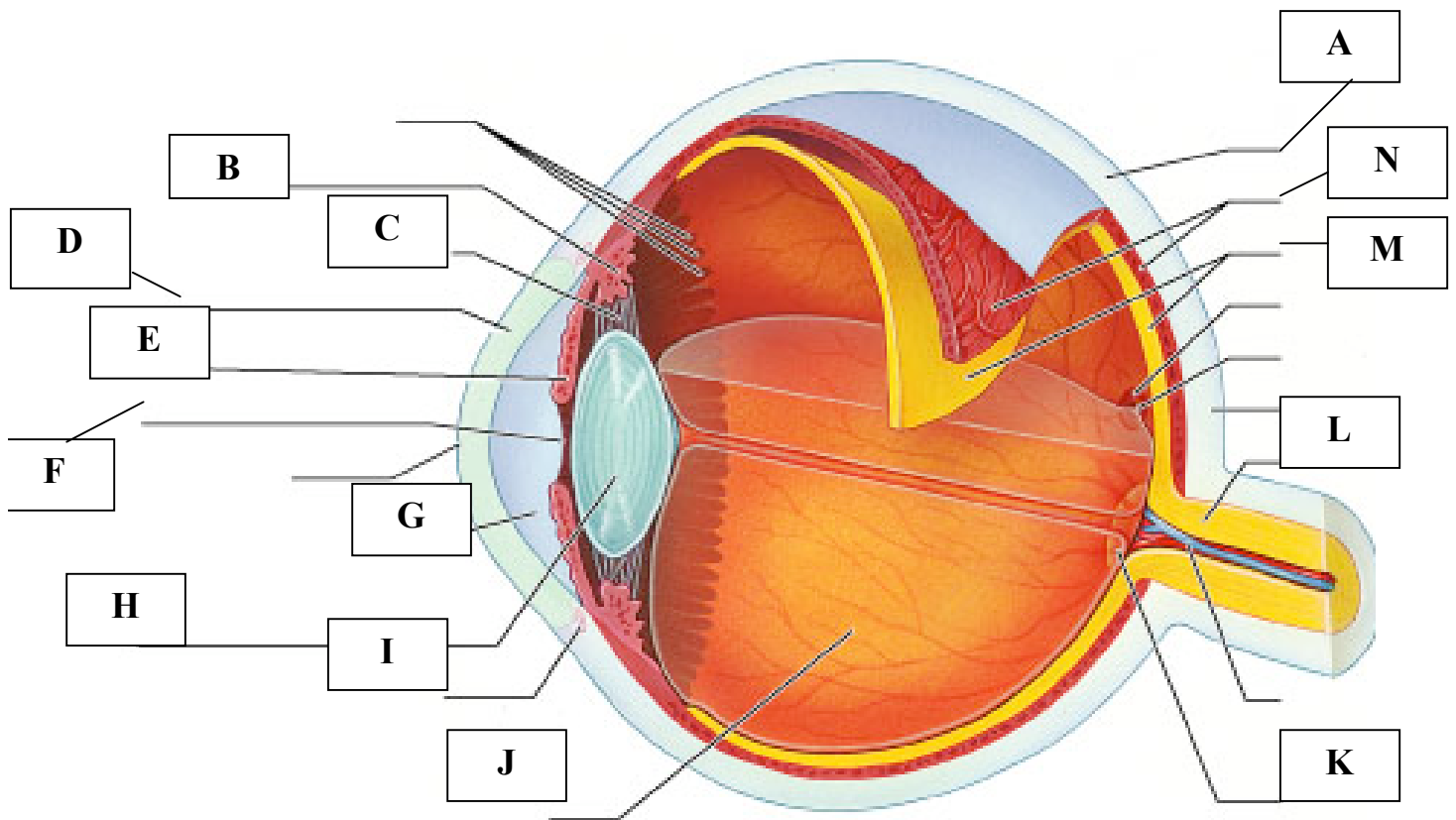
Autonomic (circle one)

7. Use the figure in the lab manual to trace an impulse from the retina to the visual cortex.

Axons of ganglion cells of the retina \Rightarrow _____ \Rightarrow

_____ \Rightarrow _____ \Rightarrow synapse in the

thalamus \Rightarrow _____ \Rightarrow visual cortex

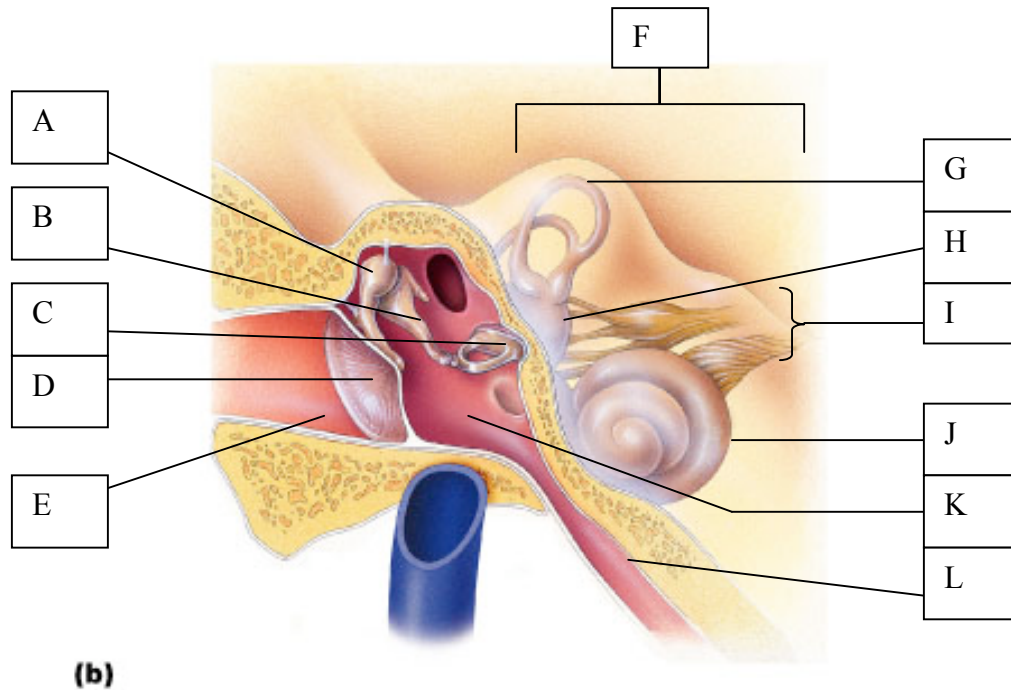


8. Match the letters on the figure with the terms below:

____ Aqueous humor
 ____ Choroid
 ____ Ciliary body
 ____ Cornea
 ____ Iris
 ____ Lens
 ____ Optic disc

____ Optic nerve
 ____ Pupil
 ____ Retina
 ____ Sclera
 ____ Scleral venous sinus
 ____ Suspensory ligaments
 ____ Vitreous body

The Ear



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9. Label on the figure:

___ Auditory tube

___ Cochlea

___ External auditory canal

___ Incus

___ Inner ear

___ Malleus

___ Middle ear cavity

___ Semicircular canals

___ Stapes

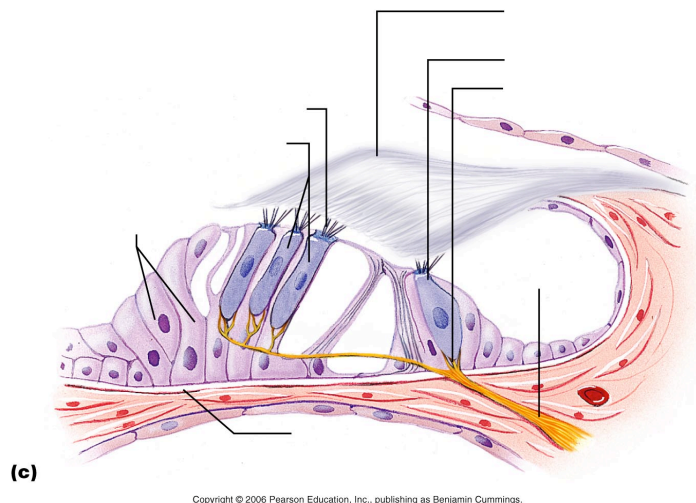
___ Tympanic membrane

___ Vestibule

___ Vestibulocochlear nerve

10. What is the role of the hair cells of the cochlea in hearing sounds of different pitches?

11. Why should you wear ear plugs at loud concerts?

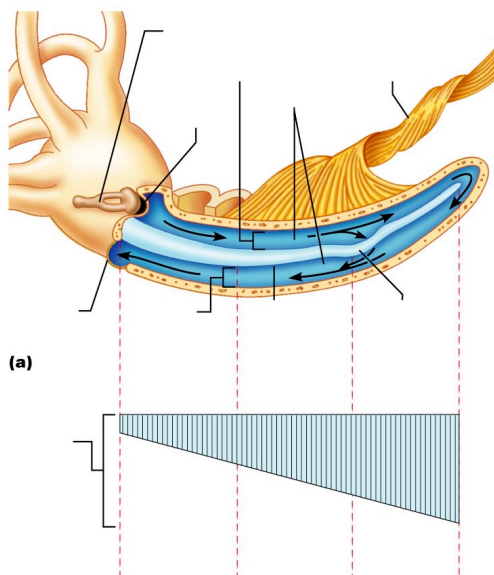


12. Label: **Print** the labels in the margins.

basilar membrane
cochlear nerve

inner hair cells
outer hair cells

tectorial membrane



12. Label: **Print** the labels in the margins.

basilar membrane
cochlear nerve
stapes
oval window